IPAC
INDUSTRIAL PARTNERSHIP AND COMMERCIALIZATION

Smart Oil-well Casings

Increasing Yields from Primary and Secondary Oil Recovery

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Better reservoir tracking can help increase primary and secondary oil recovery

- Identify bypassed oil and fluid-flow barriers
- Map fluid-saturation changes
- Optimize well locations
- Avoid early water or gas breakthrough

Current reservoir monitoring uses separate tomography technologies

- Seismic
  - Vertical Seismic Profiling (VSP)
  - Interwell Seismic Imaging
  - Crosswell Seismic Imaging
- Electrical Impedance Tomography (EIT)
- Magnetic Induction Tomography (MIT)
- Ground Penetrating Radar (GPR)
- Acoustic

Smart Casings can help gain insight into oil reservoir parameters

- Combines data from multiple sensor types
- Uses modern data fusion technology to combine orthogonal data
- Yields continuous, real-time knowledge oil reservoir critical parameters
- Sensors located deep within the reservoir are much more sensitive than sensors located on the surface

Smart Oil-well Casings technology has low impact on current designs

- Densely spaced network of sensors is emplaced along and outside oil well casings
  - Seismic sensors
  - EIT electrodes
  - MIT induction coils
  - Tiltmeters
  - Thermocouples
- Does not interfere with normal well operations
- Low capital cost of instruments
- Low operating costs for data acquisition
- Data acquisition can be remote

LLNL is looking for a company to license this technology

- The intellectual property portfolio consists of:
  - 1 Provisional Application
  - Results from 2 experiments
- LLNL is committed to:
  - Commercialize the technology for the benefit of the U.S. economy and of the general public
  - Exercise *Fairness of Opportunity* procedures in licensing http://www.llnl.gov/IPandC/workwithus/partneringprocess.php
- LLNL will license patents to companies equally committed to commercialize the technology
- Foreign companies must satisfy certain requirements that provide for the benefit of the U.S. economy

Interested companies can contact . . .

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LLNL IPAC Technology Profile
http://www.llnl.gov/IPandC/technology/profile/announcement/SmartBoreholeCasings.php

- Most of the IP is in the provisional application stage. A Mutual Non-Disclosure Agreement (MNDA) is required before technical discussions with inventors can be arranged.
- Companies requesting to license the technology must complete a commercialization questionnaire, so LLNL can evaluate the company's technical, management, and financial capabilities.